Cognitive Science 5
Lecture 9.1

Last time

This time

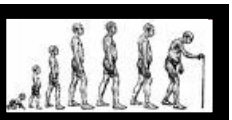
Language acquisition
Also the connection between language and culture

Language Acquisition

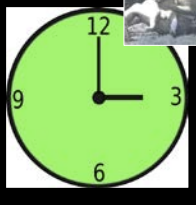
Language acquisition

The process by which humans learn to perceive, produce and use words to understand and communicate

Language acquisition



A gradual process, continues until we die
Example: Rock star Mick Jagger is still learning language



Language acquisition

Similar processes and stages occur across languages

Swedish

Inuit

Guarani

Why study language acquisition?

- shows us how language ability evolves in a single person
- helps us see emerging patterns across speakers and across languages
- tells us about the mental structures and representations involved in language and thought in general
- There are various methods for studying language acquisition

Methods

Diary study: *parent writes everything down*

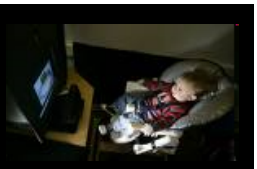
Naturalistic studies:

watch and record everything a child does and says, often over a long period of time

Some naturalistic studies are longitudinal
→ recorded & studied over an extended period of time

More and more people are videotaping their kids

Methods



Experimental studies:

Study a child in a lab under various controlled conditions

Experiments can be designed to test a child's ability to imitate language, produce language, understand language

Here come some examples of experimental studies…

Methods

For comprehension

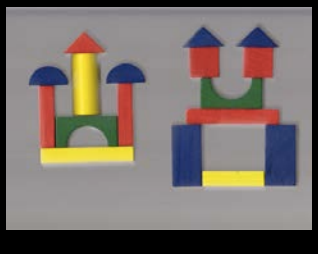
Give child some toys and ask him/her to act out the meaning of sentences, such as "The truck bumped the car" or "The car was bumped by the truck (ACTIVE versus PASSIVE voice)

Methods

Also for comprehension

Ask a child to judge the truth of a given situation

Example: "Is the red triangle on top of the yellow cylinder?"



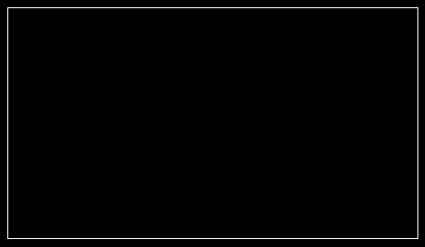
Methods

Also comprehension

Show objects to a child and say the name of the object


Measure electromagnetic activity of brain while kid hears object name

Methods



Measure electromagnetic activity of brain

Some studies focus on deficits or challenges that present in early childhood

Methods

Production Give the child a situation relevant to a particular linguistic form, and ask him/her to say or ask things in an open-ended way

"Ask the cheetah if the panda is sleeping"
tests the child's knowledge of question formation)

Methods

Imitation studies

Ask child to repeat a linguistic form and study their mastery of that form

For phonetic form: Say "scary"

possible responses: [skɛri], [skɛwi], [skɛli], [skɛj],

For grammatical form: Say "Buster's hat"
possible responses: *Buster's hat, Buster hat, Bust-hat, hat*

Experimental studies

Many advantages of **lab studies**

Here's one: Researchers can collect data of a particular type under controlled situations *and compare it to other children's data under controlled situations*

One disadvantage: Spontaneity and creativity are missed

Stages of language learning

Researchers who study language acquisition like "slice" up learning stages in different ways

Still, most agree learning proceeds something like this…

Zak

1. one to six months: **Cooing stage**

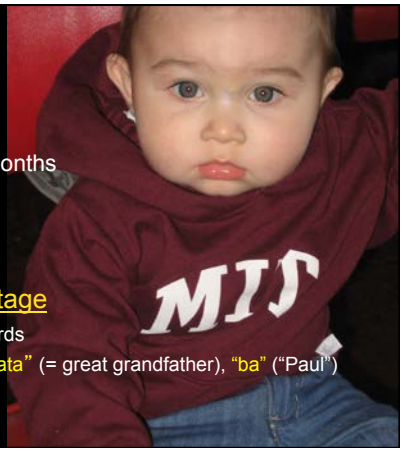
At first, hearing many human speech sounds
Exercising vocal tract, random sounds, can distinguish and produce virtually all speech sounds in the world

Zak

2. six months: **babbling stage**

can't process all sounds anymore
start making regular sounds, like ba-ba, ta-ta, na-na
intonation patterns start to form

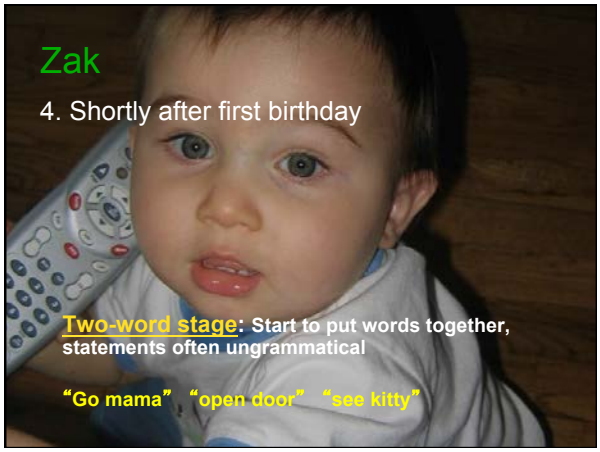
Zak



3. Nine to 12 months

One-word stage
starts to say words
like "mama", "tata" (= great grandfather), "ba" ("Paul")

Zak



4. Shortly after first birthday

Two-word stage: Start to put words together, statements often ungrammatical

"Go mama" "open door" "see kitty"

Zak

Age 3-4:
speaks well overall

"Elmer Fudd" accent
Examples:
[skɛwi] (*scary*), [wɛd] (*red*)

Overgeneralizes verbs
Examples:
I runned to get it
You drived Paul's car?

Zak

At age 5, Zak had minimal speech problems, and was learning to read English

Zak

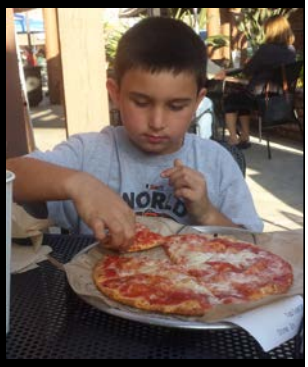
Age 8

Fluent speaker of English, mild dyslexia

Examples:

"How much frogs are there?"

"How much potatoes?"

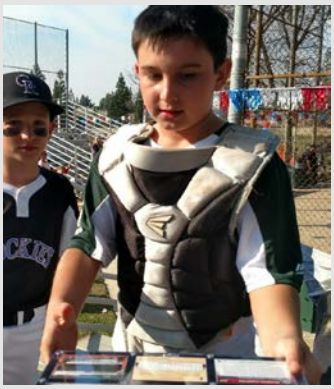


Zak

Age 10

No speech problems

Doesn't enjoy handwriting, but excels in math and most school work



Other info about language development

Toddlers often avoid using closed-class (function) words

like *of, in, for, and, is, the*

They use mostly open-class (content) words

dog, banana, mama, go, eat

Example:

baby sat chair (instead of *the baby sat in the chair*)

Question

So is language acquired or learned?

There's a slight difference…

Caregiver speech (aka motherese)

There is much research on how the speech of mothers and other caregivers influences kids

This kind of language often includes

- slow, careful speech
- exaggerated intonation and stress
- high pitch
- longer pauses

phonetic

- more restricted vocabulary
- mostly "here and now"

semantic

- incomplete or short and easy sentence structures
- many imperatives and questions

syntactic

- a lot of repetition in conversation

conversational

What Chomsky claims

Much of language acquisition is innate (pre-wired)

His well-known **poverty of the stimulus** argument:

Kids cannot learn well from parents/others because stimuli in the environment is poor

Examples:

People say stuff like, "uh.."

They use incomplete or ungrammatical sentences

How could babies possibly learn from such poor input? Therefore, language must be innate…

Another approach

Language is gradually learned
The child is immersed in a rich environment
Understanding emerges over time
It also involves skill, like riding a bike

Poverty of the Stimulus

Infant babbling with dad

More on babbling

If you look at all languages, kids in those languages tend to use THESE sounds

p	b	m	
t	d	n	
k	g		
s	h	w	j

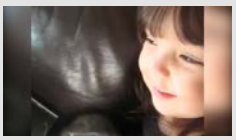
Kids talking as they develop linguistic competence

https://www.youtube.com/watch?v=yECd_Sz_zJ8&list=PLAFs9JCEzzmK-fvM0hGOQ7ys2Zy79kHIC

Odd things kids say

https://www.youtube.com/watch?v=HUm7RHi_6rU






LANGUAGE AND CULTURE

What's the connection between the two?

- heated debate in cognitive science

Benjamin Lee Whorf

Background (1897-1941)

- trained as an engineer at MIT
- interested in North and Central American languages
- famous for work on Hopi

Edward Sapir

Background (1884-1939)

- degree in Germanics
- studied many American languages, especially Algonkian languages, including Paiute, Chinook, and Nootkah
- taught many famous linguists, including Benjamin Whorf and Zellig Harris (Chomsky's advisor)

Sapir and Whorf

- Very interested in the cultures of North and Central America
- In analyzing the languages them, they observed many differences from European languages
- → different grammatical systems, different words, different sounds, etc.

Sapir-Whorf hypothesis

Early to mid 1900s

- Many researchers were interested in SWH, especially how language shapes thought in various languages

Later 1900s

- SWH unpopular for many years (while generative view of language dominated in the 1960s, 1970s, 1980s)

The past 20 years

- SWH has made a big comeback

Some examples of linguistic relativity

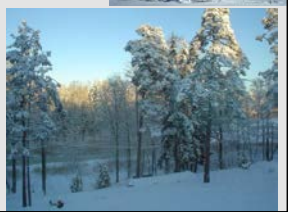
Differentiation

Every language has a set of words to express concepts in specific domains

weather, emotion, color, time, numbers, etc.

Some domains are highly differentiated

Some are not



Weather: Words for snow

In Eskimo languages (Canada, Alaska), there are many words for snow, more than in English or many other languages

At one point, some linguists and anthropologists claimed there were over 30 terms

But in fact it's hard to "nail down" an exact number

English NOW

Very elaborate tense and aspectual system for marking time – when and how events happen

We will have a party
We will have had a party
We had a party
We had had a party
We have had a party
We were having a party
We are having a party
We will have been having a party

Hopi → time?

Hopi language

expresses time differently (from Western languages)

No specific words for past or future per se

Based on this, Whorf concluded that Hopi can't/don't think about past and future; instead, they always think about "here and now"

Aymara and time

Differences in gestures (from English)

Talk about past in front of body

Talk about future behind body

South America, the Andes

Múra-Pirahã language

Spoken in Brazil, Amazon basin

Unlike many languages, it lacks numbers per se

Has only three words that roughly describe quantity
"a few", "some", "many"

Also lacks plural versus singular
Can't say, "One tree" or "ten trees"

Basic color terms

This class of words is highly differentiated across languages
- occur in every language in the world
- monomorphemic = have only one morpheme ("blue", not "dark blue")
- are not contained in another color term (not "green-blue")
- are not things that are restricted to small categories of things (words like "blond" only applies to hair)

Seminal work on this: Berlin and Kay (1969), Berkeley
The big questions:
- What is universal and what is culturally driven?
- Do color terms in your language influence your perception of the world?

Went around the world obtaining judgments on colors
"What color is this?" → "red", "rojo", "rouge", "rot", "ahmar"

Berlin and Kay

In studying basic color terms across languages/cultures, they discovered that
1. All languages have words for black and white
2. If a language has three color terms, one must be red
3. If a language has four, one will be yellow or green but not both
4. If a language has five, it will have green and yellow
5. If a language has six, it will have a word for blue
6. If a language has seven terms, there will be a word for brown
7. If a language has eight or more terms, it will contain a word for purple, pink, orange, and/or gray

→ They argued that perception of color is universal

All languages have basic terms to describe color

They have or deviate from this list of 11 basic color terms:
white black red yellow green blue brown purple pink orange gray

Some languages have all, some have a few
- English: has all 11
- Piranha: dark light
- Dani has only two black white
- Ancient Greek: black white yellow red
- Tzeltal (Chiapas, Mexico): black white yellow red green

Basic color terms

More info about differentiation and basic color terms in languages other than English

Mandarin: *qīng* describes **blue** and **green**
Japanese: *ao* is used for both **green** and **blue**
Kwakwa'la (Vancouver, Canada): ibenxa for both **green** and **yellow**
Shona (Bantu language, South Africa): one word for **blue-green** and another for **yellow-green** (no word for pure green)
Russian: two types of blue: **sinij** and **goluboj**

Spanish speakers: what words for **brown**?

Hopi

One word for everything that flies (except for birds)

So, one word for airplane, aviator, various insects, helicopters



Korean

Honorific form

When Koreans talk to older people, they use a special grammatical form (to show respect)

That form is different from the one they use when not talking to older people

Does this mean Koreans think differently about social hierarchies? Does the difference cause them to have different ideas about hierarchy? Or does it go the other way?

Other differences from English

Grammar

Hopi	some words that are nouns in English are verbs in that language (e.g., lightening)
Arabic	VSO, not SVO
Wintu	evidential indicating direct visual evidence
Spanish	pro-drop language

What might these forms mean for how people in these cultures think?

Testing Linguistic Relativity

Some linguists believe that language influences thought, while others do not

Noam Chomsky doesn't place much value on this; thinks the question/ issue is irrelevant to language structure/use

Next time

Guest speaker (mini-lecture) Dalia Magana

Second language Acquisition